UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,484	09/22/2006	Elio Marioni	7202-107	2278

30448 7590 10/16/2008

AKERMAN SENTERFITT
P.O. BOX 3188
WEST PALM BEACH, FL 33402-3188

EXAMINER	
MYERS, JESSICA L	
ART UNIT	PAPER NUMBER
3746	
MAIL DATE	DELIVERY MODE
10/16/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,484	MARIONI, ELIO	
	Examiner	Art Unit	
	JESSICA L. MYERS	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

First Paragraph (112, First)

In Reference to Claim 1

1. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 discloses in lines 11-13 that the pump turn on and off is regulated based on a signal from the pump's float sensor and a measured difference between a critical load angle and a current load angle computed during different working conditions of the pump. This statement is not enabled by the specification since the specification does not disclose how the critical load angle is derived or how a current load angle is measured or computed. The specification merely states that the rotor induction is measured, which suggests that the current, and not the load angle is being measured in order to determine the load on the pump (see page 8 lines 23-27). Although the specification states that the counter electromotive force and the rotor induction are complementary, it is unclear how the critical load angle and the current load angle are measured or calculated using only a position sensor.

Furthermore, the specification does not disclose how the critical load angle is calculated, or how the "measured difference between the critical load angle and current

load angle" are computed during different working conditions of the pump. That is, is the critical load angle computed using different working conditions, or is the current load angle calculated during different working conditions?

Additionally, the claim requires that both the pump turn on and the pump turn off be regulated based on the float level sensor and the load angle difference. However, according to the specification, only pump turn off is controlled this way, while pump turn on is controlled by a synchronization signal and a Hall Effect sensor, though which Hall effect sensor (the one associated with the float or the one associated with the rotor) is left unclear.

Claim 1 also requires that the electronic driving device be "enabled" by the float signal. It is unclear what is intended by the term "enabled," whether the device is turned on by the float signal, or whether the level sensor would merely allow the device to operate (see also page 6 lines 25-27 of the specification).

Finally, it is unclear from the specification how V is used as a synchronism signal, as required by claim 1. V itself is a measure of the supply voltage of the motor, and it is unclear what this signal is meant to synchronize, since it is never disclosed that this signal is compared to another signal, or that the signal by itself could be a measure of synchronization.

In Reference to Claim 9

2. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 9 asserts that phase displacement is indirectly measured in the pumping unit, but it is unclear what the relationship between phase displacement, load angle, and back EMF is. Furthermore, no use for this value of phase displacement is disclosed, and it is unclear why it would need to be derived in the first place.

In Reference to Claim 11

3. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 11 discloses that the critical load angle is a mean value taken from N sampled values. It is unclear how the N values are taken, whether it be during the operation of the pump, or at a time prior to the pump's period of use. Furthermore, it is unclear how many sample values are taken or how an initial value of critical load angle is derived at the start up of the pump.

Second Paragraph (112, Second)

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 recites the limitations "said switch" in line 7, “the signal” in line 11, and “said level sensor” in line 12. There is insufficient antecedent basis for these limitations in the claim.

6. Claim 9 recites the limitations "said phase displacement," “said unit,” and “said sensor”. There is insufficient antecedent basis for these limitations in the claim.

7. Claim 11 recites the limitation "a mean value" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,390,780 to Batchelder et al. (Batchelder et al.) in view of U.S. Patent 5,434,491 to Marioni (Marioni).

In Reference to Claim 1

Batchelder et al. teach an electronic driving device for turning on and off a synchronous pump comprising a synchronous electric motor with a permanent-magnet rotor (see abstract), comprising:

at least a static power switch (trigger circuit (90) serves as a switch) inserted in series between the motor (12) and an electric power supply source (DC battery, see column 7 lines 57-61); and

a processing unit (PCB unit (58)) having at least an input receiving a synchronism signal (reference circuit (94) receives a supply voltage V2 and a ground voltage) and a control output connected to said switch (see figure 11);

wherein the electronic driving device is enabled by a signal emitted by a float level sensor (float assembly (40) and reed switch (42)) and includes an input receiving a signal by a position sensor detecting the rotor polarity and position (sensor (104) is used to detect the load on the motor, which could be used to derive the rotor's position and polarity);

wherein the pump turn-on and off is regulated according to the signal emitted by said level sensor and to a measured difference between a critical load angle and a current load angle computed during different working conditions of the pump (The pump is turned on based on a signal from the float sensor, while the pump is turned off based on a detected load of the pump motor, see columns 9-10 lines 61-12).

Batchelder et al. fail to teach that the motor is driven by an alternating current power source.

Marioni teaches a synchronous motor device, see figures 1 and 2, where the motor attains synchronized speeds very quickly (see column 1 lines 40-45). It would have been obvious to one of ordinary skill in the art at the time of invention to use the motor of Marioni to drive the pump of Batchelder et al. since synchronized pumps do not have any motor slip, and since they are known to be effective in applications where large amounts of horsepower are required at lower speeds, much as the bilge and sump applications described by Batchelder et al. Since the motor of Marioni is a synchronous motor, it would necessarily be run off of an alternating current power supply.

In Reference to Claim 2

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), wherein said position sensor is a Hall-effect sensor (Marioni teaches that a Hall effect sensor can be used to help determine the phase shift between the voltage and current of the motor, which could be used instead of the method of Batchelder et al. to determine the load of the pump motor.).

In Reference to Claim 3

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), wherein the motor comprises rotor poles 0s~g) divided by an ideal plane (see figures 1 and 2 of Marioni) whose rest position is orthogonal to the position of said position sensor (the position of the plane in relation to the sensor, as shown in figure 2, is approximately 90˚).

In Reference to Claim 5

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), wherein the float of said level sensor is incorporated in an envelope (the float (40) of Batchelder et al. in enveloped in a compartment (41)), externally associated with the body of the pump (the compartment is located outside of the pump chamber inside of nozzle case (22)) and the sensor element of said level sensor is housed in the pump body in correspondence with said float (the sensor's magnet (46) is located in the housing in the float).

In Reference to Claim 6

Batchelder et al. as modified by Marioni teach the device according to claim 5 (see the rejection of claim 5 above), wherein said float (Batchelder et al. (40)) is equipped in its lower part with a permanent magnet (The magnet (46) extends into the lower portion of the float).

In Reference to Claim 7

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), wherein said pump is an immersion pump (the pump is meant to be submerged in a tank, see column 1 line s8-25 of Batchelder et al.).

In Reference to Claim 8

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), wherein said electronic device is housed on an electronic board (PCB (58)) positioned inside the pump body in a position just underlying the float level sensor (see figure 8, where the PCB (58) is located just below the reed switch (42) portion of the float sensor).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder et al. in view of Marioni, And in further view of U.S. Patent 6,452,202 to Eom (Eom).

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), but do not teach that the float level sensor comprises a Hall probe.

Eom teaches an apparatus for measuring the level of liquid in a tank where a float (15) and a Hall sensor that responds to a magnetic force is used to measure the positional displacement of the float (see column 2 lines 41-46). It would have been obvious to one of ordinary skill in the art at the time of invention to use a Hall sensor to sense the position of the float of Batchelder et al. as taught by Eom in order to give a more precise measure of the float's position.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder et al. in view of Marioni, and in further view of U.S. Patent 5,015,151 to Snyder (Snyder).

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), but do not teach that the pump is immediately turned off if the value of a counter is greater than a predetermined time limit defined for an emergency stop.

Snyder teaches a similar method of pump control based on the motor load of the pump. Additionally, Snyder teaches that when the motor load indicates that the pump is no longer pumping liquid, the pump is not shut off until a period of time passes. That is, once pump off is sensed, the motor load must remain down for a period of time before the pump is shut off. Thus Snyder teaches that the pump is immediately turned off if the value of a counter is greater than a predetermined time limit (Snyder discloses that the pump load must remain low for at least 10 seconds before it can be turned off) defined for an emergency stop (This time period is derived based on how long the pump can operate with no load without being damaged, see column 4 lines 4-18, and columns 5-6 lines 44-14). It would have been obvious to one of ordinary skill in the art at the time of invention to use the method as taught by Snyder to control the turn off function of the pump of Batchelder et al. as modified by Marioni in order to ensure that the pump is fully empty of liquid before shutting the pump off, in case the float malfunctions.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder et al. in view of Marioni, and in further view of U.S. Patent 6,625,519 to Goodwin et al. (Goodwin et al.).

Batchelder et al. as modified by Marioni teach the device according to claim 1 (see the rejection of claim 1 above), but do not teach that the apparatus further comprises a first time counter that is incremented every time instant wherein the float level sensor is low and the pump is off to check the inactivity time period of the pump and turn it on for a predetermined short time period.

Goodwin et al. teach another pump controller unit that controls the pump based on the power factor of the motor. The pump unit is for a fuel dispenser, and even when the pump is shut off due to a lack of fluid, the pump is still periodically activated to ensure that the fuel tank is empty. Any time the fuel dispenser it activated the pump motor is reactivated for a short time. If the pump motor is still unloaded, the pump is then shut back off again, see columns 2-3 lines 62-5. Thus Goodwin et al. teach a first time counter that is incremented every time instant wherein the float level sensor is low (the fuel dispenser activator can be seen as a time counter that operates when the pump level is low) and the pump is off to check the inactivity time period of the pump and turn it on for a predetermined short time period (the pump is turned on for short periods of time to ensure that no liquid is in the pump). It would have been obvious to one of ordinary skill in the art at the time of invention to use the method of Goodwin et al. to ensure that there is no liquid in the pump of Batchelder et al. as modified by Marioni when the pump is off so that there is no chance that the sump overflow due to sensor malfunction.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,241,299 to Bertone and U.S. Patent Application Publication 2002/0090303 to Scott teach similar pump control apparatuses.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/JLM/